MobiSense system

User manual

For use with hardware 1.2 & 1.3

This manual contains the description of MobiSense hardware V1.x

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What is in the shipment:

The MobiSense basic is sold without options, power supply or cables.
You should compare the shipping list with the order placed.
Any discrepancies should be reported immediately to your local distributor.

First time power on.

Before you start working with the unit you should be aware of the following:

Charge the internal MobiSense battery. This goes automatically after applying power fore 24h. This battery is for RTC and ultra low power measurement only it will **not feed** display, GPRS, compact-flash or other parts of the MobiSense.

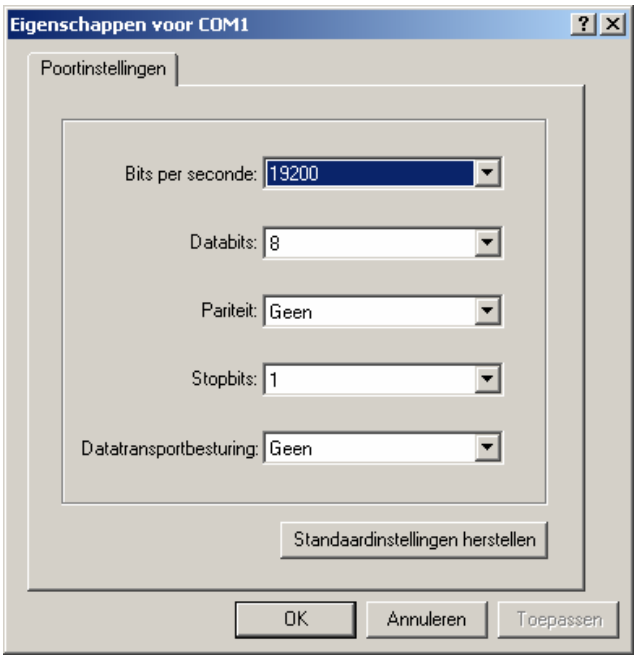
Use a 9-pin DTE-DCE datacom extension cable.

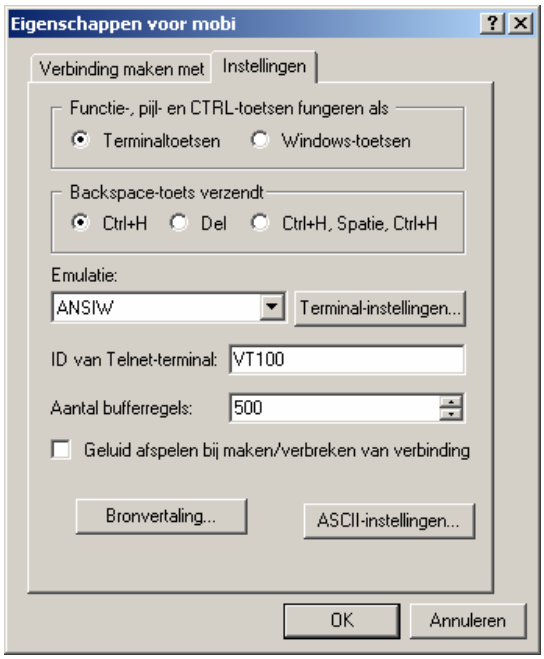
Make sure that your RS232 interface is within the specifications for the voltage levels. (Some pc will not follow that standard –12V to +12V).

Select the correct speed 19200 BPS no parity one stop bit.

Select ANSI code.

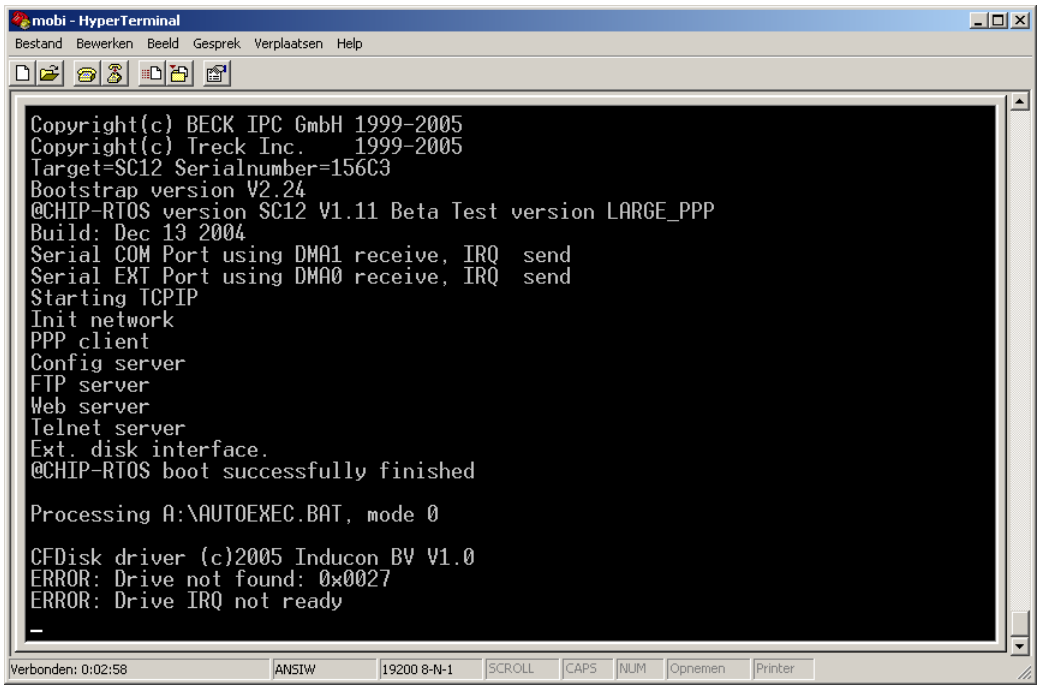
A screen on PC with HyperTerminal looks as follows:



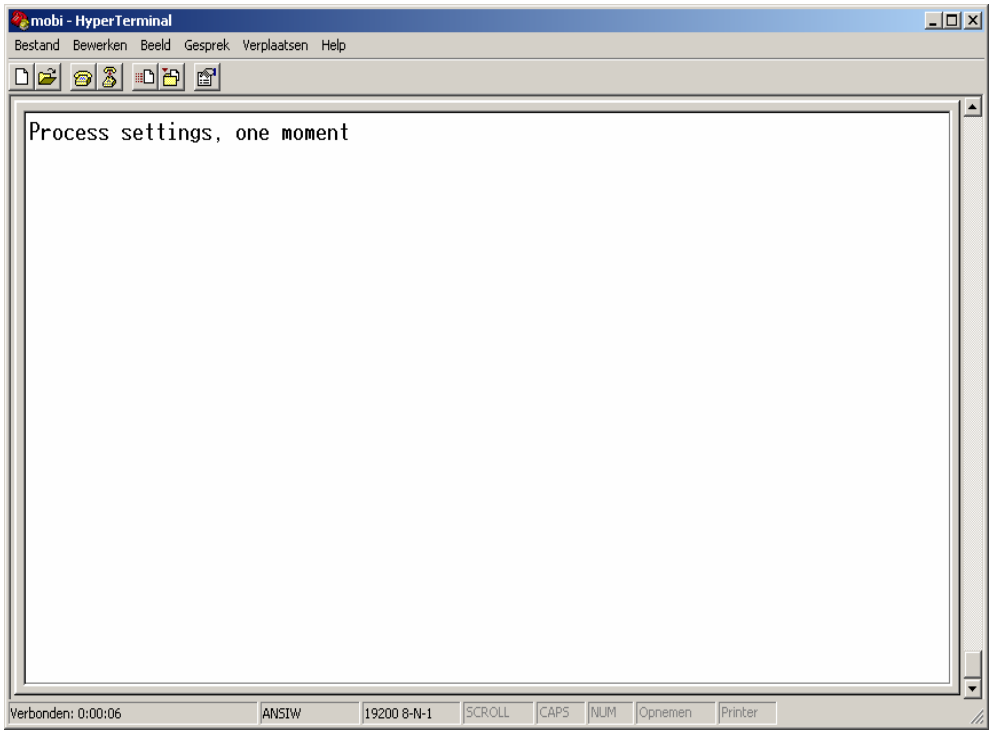


Cabling

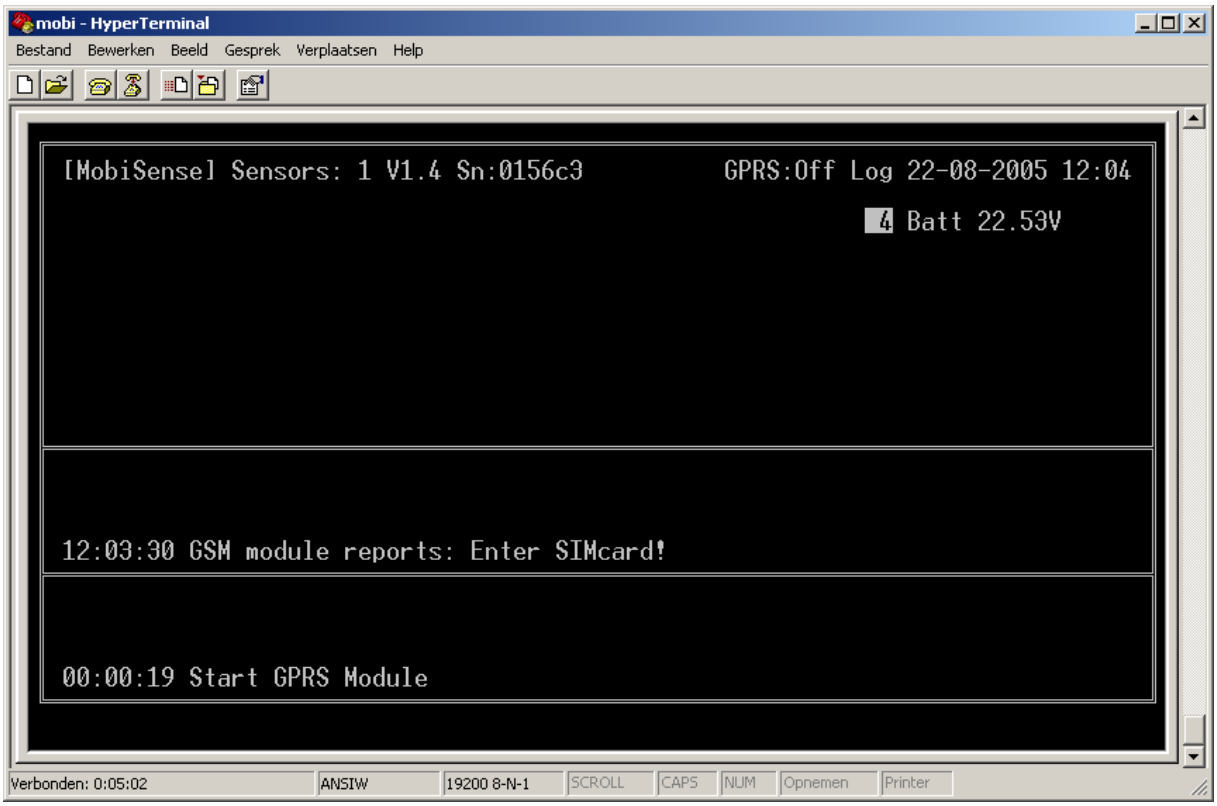
Use a 9 pin datacom extension cable to make connection between MobiSense console port and your PC or terminal. Switch the MobiSense on by applying power to the unit the voltage should between the 9-36 volts DC.
The follow screens will show up:



Error messages might occur due to absence of certain components like compact flash.



After a complete start-up the screen, from a new delivered MobiSense will show the following:



“Start GPRS module” message will only appear if GPRS unit is mounted and activated in the software.
The message in the right top GPRS:off is the GPRS communication indicator.
No GPRS link is operational and the simcard is missing.

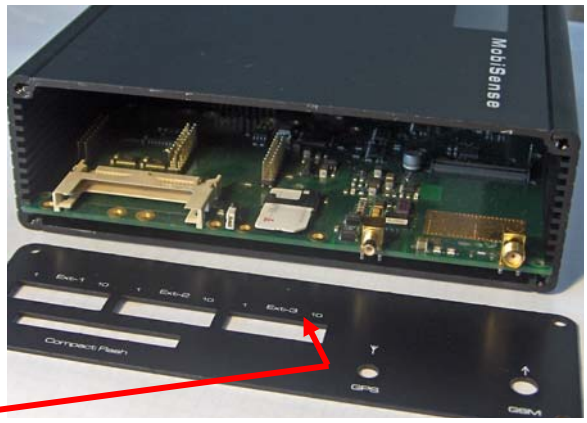
Next step is to check date and time visible at the top right corner of the screen.
See set time to make alterations. Please do not change it right now wait until we reach ‘how to configure’ in this manual.

The voltage of the connected power supply is now visible. See configure to make this invisible.

Simcard:

Only applicable if a GPRS/GSM module is installed.

Location: The simcard is next to the compact-flash card located. To enter the card you should follow the following procedures:



A: Disconnect the power cable from the MobiSense.
B: Use a Phillips screwdriver to remove the four screws located at the site panel. This is the panel where the compact-flash entry is visible.
C: Look for the simcard holder and put the card in the correct way, contacts facing the PCB, in its slot. The cut-off corner of the simcard is now visible at the edge of the MobiSense PCB.

Note: Some providers ship simcards with standard password protection. The MobiSense has no keyboard hence no password entry is possible. Use a mobile phone to enter password on the simcard and place the simcard back into the MobiSense. There is an OEM keyboard available please see your local dealer. This OEM keyboard is a major change in hard and software.

The unit is now ready to configure!

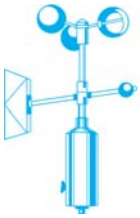
MobiSense connections:

The following communication interfaces are available on a standard MobiSense:

RS232 (V24)	Console port (19200 bps 8N1)	DB-9
Ethernet 10Mb/s	Network port	RJ-45
RS232 (V24)	Serial measure input	DB-9
Voeding	9-30V	Power-jack
RS485	NodeLink	RJ-11
Coax 1	GSM/GPRS antenna	SMA
Coax 2	GPS antenna	SMX
CFDisk	CompactFlash disk storage	CFSlot

Internal:

Measure input 1	Connection measure and generation
Measure input 2	Connection measure and generation
Measure input 3	Connection measure and generation
Measure input 4	Connection for future expansion.



Possibilities:

The MobiSense allows you to transport measurement values over an IP and or GPRS network.
The MobiSense is capable of handling the following sensors or generate the following signals:

- 4-20 mA (effective: 0-25mA)
- -10V to +10V
- 64 external nodes providing measure and signal generation.
- RS232 serial control or logging serial data.

The MobiSense is capable of handling 128 channels.
Each channel is an autonomous process and designed to evaluate one of the internal or external measure inputs or outputs.

A channel describes and validates the measured value against under- and upper thresholds, unwanted changes or lack of activity. A channel describes the data routing also. (Like source and destinationtion)

The MobiSense is able to accommodate Sixty-four External MobiNodes via a RS485 interface
Each MobiNode are entities able to measure or generate: Current, voltage frequency etc.
An external node could carry many channels and should be seen as a device with many different input, outputs or functions..

The MobiSense is able to transport Voltage, current and pulse over an IP network.
Data received could be stored in a database or via an Inducon module transformed back to Voltage, current and pulse.

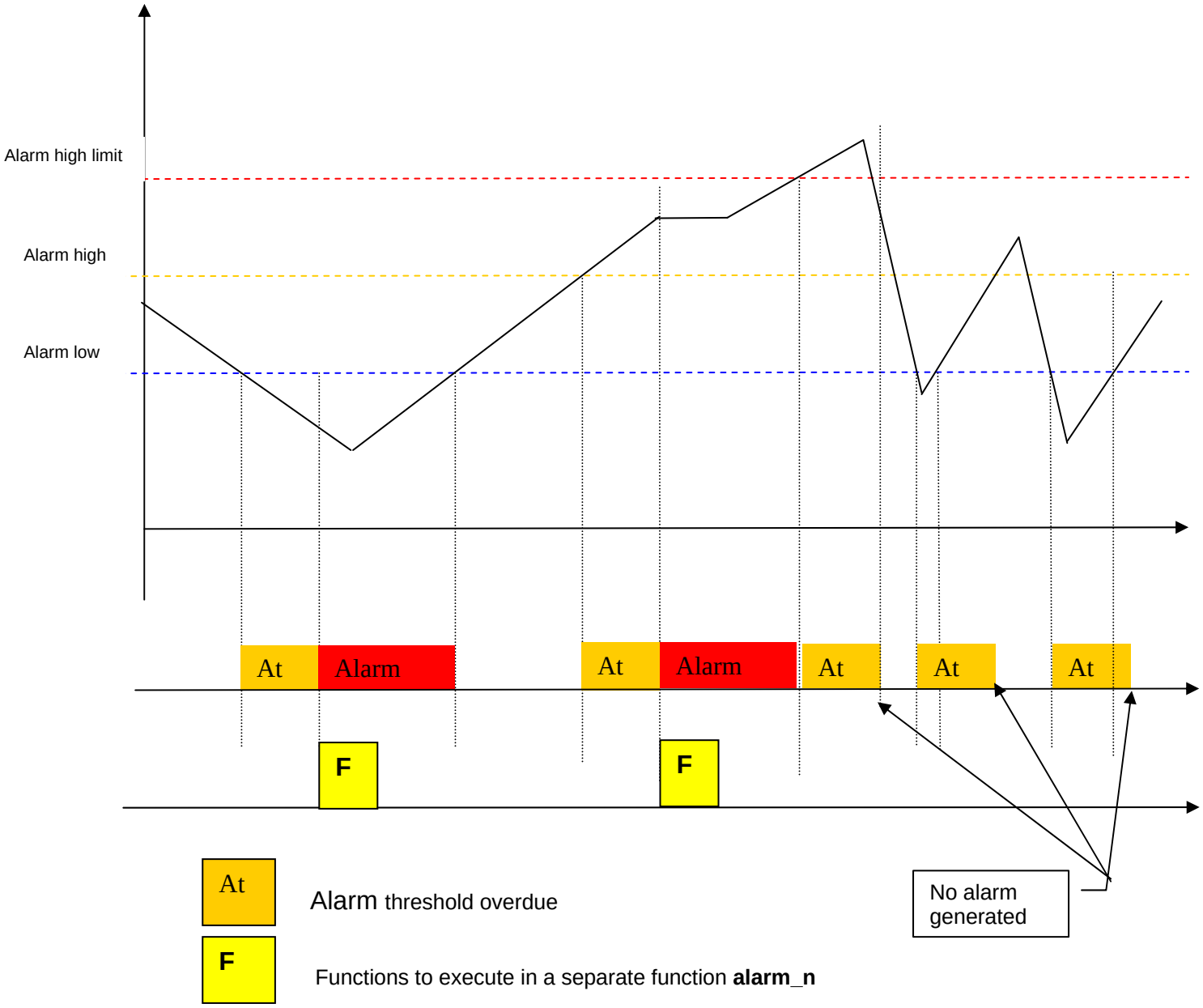
Current, voltage and pulse are the most common signals. Remember that all inputs are converted to numbers of 2.5V or 5V full-scale amplitude. This is the key to all calculations.

The 2,5V is used in a basic interface and 5V in the four-port current and voltage input interface. Four volt generated at 20 mA in a 200-Ohm resistor.
This will produce safety now able to measure up to 25 mA.

This information is important if scaling calculations are needed.

Alarm trapping:

The unit is designed to do not only logging but also for evaluating signal and take action on signal levels. Signals to high, to low, between or changes as function of time.



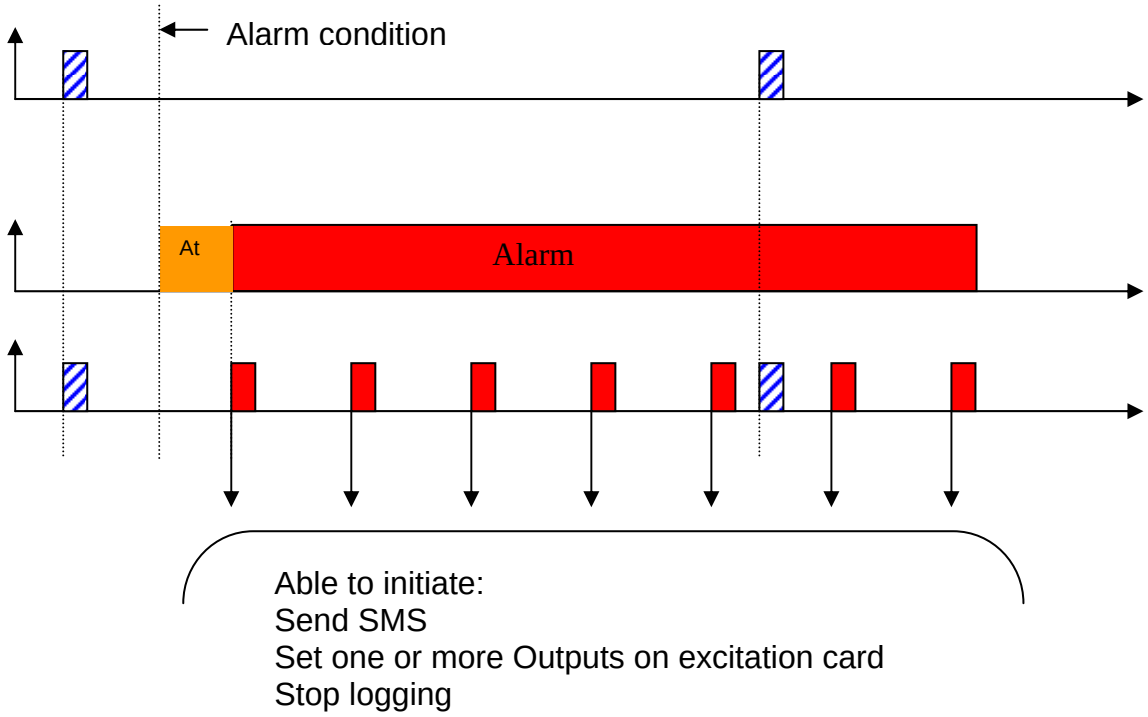
The diagram is the representation of one 'measurement' channel, which you can compare with one intelligent measurement device able of doing the things mentioned in the diagram. The MobiSense is able to accommodate 128 of these channels.

That implies that one channel has an input an output and an evaluation and calculation mechanism available. The input could be any physical measure port more than one channel is allowed to measure the same physical port allowing al type of different calculations and alarms at the same input signal. When an alarm goes of a numbered jump is generated to an alarm handler. This handler shall execute the commands given like SMS, file, transmit set output high etc.

Alarm handler

The alarm handler is able to take care of certain tasks like switch-off logging, SMS or setting outputs. In a normal non-alarm situation data could be transmitted in a given interval as defined by UPDATETIMER.

During an alarm the user is able to define a different transmission interval.

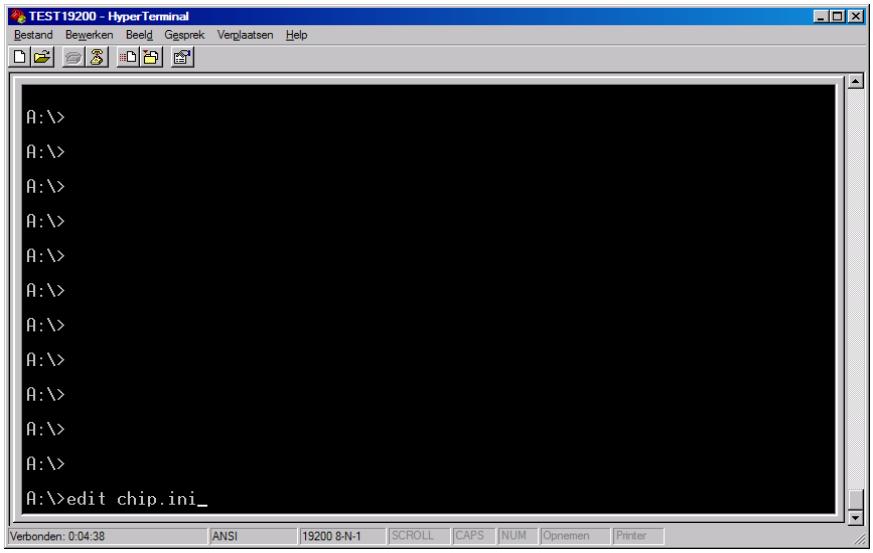


Updatetimer expires: Time to update remote unit with measured data.

Alarmupdatetimer expires: transmission interval during an alarm

Configure the MobiSense:

The first step is to stop the master application running at the MobiSense.
Press the <CTRL> key and X key simultaneously to stop the master application.
Hit the enter key a few times and a prompt a:\> will appear.



Repeat this till the prompt appears.
All information is loaded in an editable file CHIP.INI.

If you are an experienced user you could generate this file on your PC and store this file at a later stage in the MobiSense.

But first type DIR return

The following files must be present.

AUTOEXEC.bat
CHIP.ini
EDIT.exe
EXTIDE.exe
MOBISEN.exe

Missing files should be reported immediately to you MobiSense dealer.
However special build products might contain different files

Measuring in- and outputs:

Where is my input and what needs to be done before to create an output somewhere?
First you have to find out what and how to connect the internal (software) signals.

Each port has an address (port number) and is directly equated with the signal evaluation mechanism. This port could have a sub port example port 160 sub port 1 is the first physical connector in a four port ADC in slot one.

PORT= (number)

Generating port (0-2.5V, 12bit) (0.5% acc)
- 1 Internal dac 1 = 1
- 2 Internal dac 2 = 2

Inputs (0-2.5V, 12bit)) (0.5% acc)
- 3 Internal adc 0 = 3
- 4 Internal adc 1 = 4
- 5 Internal adc 2 = 5
- 6 Internal adc 3 = 6
- 7 Internal adc 4 = 7
- 8 Internal adc 5 = 8
- 9 Internal adc 6 = 9
- 10 Internal adc 7 = 10

Internal measure points
- 11 Internal adc 8 = 11 Vref
- 12 Internal adc 9 = 12 bus voltage
- 13 Internal adc 10 = 13 Temperature

Internal function
- 14
- 15

Serial communication
- 16 Serial port = 16

Measure inputs PCB's
- 160 4xADC in slot 1 = 160 (-10,+10V, 24bit) (0.04% acc)
- 162 4xADC in slot 2 = 162
- 164 4xADC in slot 3 = 164

- 172 Excitation in slot 1 = 172
- 174 Excitation in slot 2 = 174
- 176 Excitation in slot 3 = 176

- 184 Digital i/o 4 digtal in one out slot 1
- 186 Digital i/o 4 digtal in one out slot 2
- 188 Digital i/o 4 digtal in one out slot 3

External MobiNodes port addresses occupy number 21 up to number 65 (connected via rs485 network)

SUBPORT=

4xADC:

1 = ADC sub port 1 Voltage or Current
2 = ADC sub port 2 Voltage or Current
3 = ADC sub port 3 Voltage or Current
4 = ADC sub port 4 Voltage or Current

5 = ADC sub port 1 Frequency (max 500Hz, 50% duty-cycle)
6 = ADC sub port 2 Frequency
7 = ADC sub port 3 Frequency
8 = ADC sub port 4 Frequency

9 = ADC sub port 1 Pulses (max 500Hz, 50% duty-cycle)
10 = ADC sub port 2 Pulses
11 = ADC sub port 3 Pulses
12 = ADC sub port 4 Pulses

Digital I/O

Low=<0,9V High>3.5V Input current ca 2 mA Umax=32V

Counter function

1 10 Digits
2 10 Digits
3 10 Digits
4 10 Digits

Frequency function

5 < 250KHz
6 < 250Khz
7 < 500Hz
8 < 500Hz

State function

9
10
11
12

Excitation:

1 = Pulses, input 1 max 250 kHz
2 = Pulses, input 2
3 = Frequency, input 1 max 250 kHz
4 = Frequency, input 2

MobiSense commands at prompt:

Connect PC to ‘Console’at 19200.

Stop application with **<CTRL-X> key stroke**.

After <CR> the prompt (a:) appears.

All action at prompt level must be altered within 5 minutes, or unit will reset automatically.

The following commands are available in MobiSense command mode.
This list will cover most of the common instructions.

mobisen –t dd-mm-yyyy hh:mm:ss
Set time and date
This clock is powered from an internal battery and should run for years to come.

Extra Codes to enter in monitor mode (telnet);

F FTP upload
K Send keep-alive
V Show version software (datum/tijd) compile
P power-off (MobiSense goes in sleep mode)

REBOOT

Restart MobiSense, important after altering chip.ini file.

EDIT

Start editor to modify chip.ini file “EDIT filenaam”

DIR

Show content FlashDisk, default drive A:

FTP

Utility allowing file transfer to and from MobiSense at command prompt.

FTP [OPTION] IP USER PASSWORD ACTION SOURCE [DESTINATION]"

OPTION: -P Passive mode
-A ASCII mode datatransfer (standard binairy)

IP IPaddress FTP server"

USER Login server
PASSWORD Password server

ACTION:
GET get “SOURCE” send to “DESTINATION”
PUT transmit “SOURCE” send to “DESTINATION”
DEL remove file
REN rename directory
MKD create directory
RMD remove directory

DEL

Remove file
DEL ‘filenaam”

REN

Rename file
REN “filename old” “filename new”

COPY

Copy to flashdisk
COPY “filename” “filename”

General settings

All the settings are stored in the chip.ini file.
The chip.ini file is an editable text file.
This file consists out of a number of named groups.
The name of a group is embedded between [ ].

Type ‘**edit chip.ini’** to alter settings

Exit editor with **<esc> X**, and reset unit, or type ‘**REBOOT**’

User Settings in ‘CHIP.ini’

DEVICE
NAME=anyname
Gives a name to the unit, it will be displayed in the LCD display, in the logfile and in communication to remote units and/or receiving applications

Network settings

IP

Addres of this MobiSense
GATEWAY
IP address of default gateway of the Ethernet interface
NETMASK
Netmask of Ethernet interface
ADDRESS
IP address of Ethernet interface
DHCP
Enables DHCP for the Ethernet interface

FTP

ENABLE
Enables the build-in FTP server
USER0
Username for profile 0
PASSWORD0
Password for profile 0
ACCESSRIGHT0
Access rights for profile 0, 0 = read/write, 1= read-only
USER1
Username for profile 1
PASSWORD1
Password for profile 1
ACCESSRIGHT1
Access rights for profile 1, 0 = read/write, 1= read-only

WEB

DRIVE=1
Drive identification 0 = A, 1=B, 2=C
ROOTDIR=\logfiles
location logfiles
NAME =xxxx
default "web"
PASSWORD=xxxx
default "web"
REFRESH=60
refresh interval data

TELNET

ENABLE
Enables the telnet server
TELNETPORT
Alternative TCP port for the Telnet server (default 23)
USER0
Username for profile 0
PASSWORD0
Password for profile 0
USER1
Username for profile 1
PASSWORD1
Password for profile 1

Data communications:

STDIO

STDIN=EXT TELNET

Console input, EXT is RS232 console

STDOUT=EXT TELNET

Console output, EXT is RS232 console

SERIAL

COM_BAUD

GPRS modem speed (DO NOT CHANGE)

EXT_BAUD

Console speed

TCPSERIAL

ENABLE

Enables serial (rs232) to TCP conversion on Console port, if enabled disable 'EXT' in STDIN en STDOUT in [STDIO] (console over RS232 will be disabled)

0 = disabled

1 = client

2 = server

REMOTE

Remote IP address: for transmitting serial data.

SPEED

Serial port speed

PARITY

Defines amount of data bits, parity and stop bits.

8N1,7E1,7O1

FLOWCONTROL

Defines the used flow control the serial port.

0= 0ff

1= Xon/Xoff

2 = CTS

PORT

Defines an alternative TCP for transmitting the serial data, default port 1053.

PROTOCOL

Defines a decoding protocol, application specific.

SERIAL_2

Behaviour of serial-2/RS485 port

ENABLE=0/1/2

0 = RS232 disabled, MobiNode protocol runs on RS485

1 = serial data capture on RS232

2 = serial data capture on RS485

SPEED=9600

Speed for RS485/RS232 port

FORWARDCHAR=13

Character for forcing a fast-forwarding of the serial data.

PROTOCOL=

Protocol needed to decode Serial data

Supported: GILL

Display

LCD

DISPLAYOPERATOR=0/1
Enables the display of the GSM operator on the LCD display
DISPLAYGPRS=0/1
Enables the display of the GPRS status (G+ /G-) in the LCD display
DISPLAYCHANNEL=1,2,3
Enables the various channels that have to be displayed on the lcd
DISPLAYTIME=0/1
Enables the display of the system time.
DISPLAYGPRSIP=0/1
Enables the display of the GPRS IP address
DISPLAYREMCONN=0/1
Enables the display of the state of the IP connection (I+/I-)
DISPLAYNAME=0/1
Enables the display of the system name in the LCD display.
DISPLAYNODES=0/1
Displays the amount of MobiNode's connected.

TIME

TIMESERVER=ntp.xs4all.nl
Address of the Internet timeserver used to synchronise the build-in real-time clock.
UTC=+1
UTC offset.

Compact Flash disk:

Make sure that you use a Cfd not larger than 2 gigabyte.
Use a by Inducon BV supplied model to avoid problems later on.

Powermode

POWERMODE= 0/2 Zero for normal operation two for low power mode.

Logging:

LOGGING

ENABLE=0/1
Enable logging feature, 0=off, 1=on.

FILENAME=B:\
Sets the logfile drive name, drive B is the external CF-disk

FORMAT=0/1
Sets logging format, until now only format 0 (CSV files) are supported.

INTERVAL=300
Time Interval between time stamps. Value = Integer seconds >0

FREESIZE=10000000
Minimum free size on the disk, if not available, the oldest file will be deleted

FILEINTERVAL=DAY
Time interval before a new file will be created, can be: HOUR/DAY/MONTH/YEAR
<Not implemented yet>

Measure interfaces:

EXCITATION_n

Enables various voltages on one of the three possible excitation units

VOLT24=0/1
Switch the 24V.

VOLT5=0/1
Switch the 5V.

REF1=0/1
Switch the first 10V.

REF2=0/1
Switch the second 10V

EXCITATION_n

Dual pulse input up to 250KHz

Alarm handlers:

ALARM_A

SMS alarm has a date/time stamp (dd-mm-yyyy hh:mm:ss <message> format)

SMS=1,2	alarm A produce SMS on mobile number one and two see [SMS]
SMSMAX=120	No more than one SMS alarm each two hours (default is 12 Hours)
NAME=LOST SENSOR	name of the alarm transmitted in the SMS.
CHANNEL=2,3,4,5,6	SMS alarm is able to transmit multiple channels.
RESETCHANNEL=2,3	Reset channel values (purpose: reset counters)

ALARM_n

An Excitation voltage can be used as an alarm output, to do so you can create various Alarms. These alarm have to specify an excitation unit, a voltage and the minimum time the voltage is applied

EXCITATION=(1/2/3)
Define the slot where the specified excitation unit is.

VOLT24=0/1
Defines the status of 24V in case of this alarm

VOLT5=0/1
Defines the status of 5V in case of this alarm

REF1=0/1
Defines the status of the first 10V in case of this alarm

REF2=0/1
Defines the status of the second 10V in case of this alarm

ALARMTIME=n
Time in seconds the alarm will stay active

ALARM_x
FTPTRIGGER=0/1 // FTP upload is triggered at alarm

Note:
The ftp transmit completed filed and delete transmitted files after send complete.

However the current file is shipped but not deleted.

If you transmit this file more than one time the following will happen;

The file with [filename] will grow in time and overwrite the existing file at the FTP server. (Current file is not deleted)

SMS message exchange

Send SMS to MobiSense	Request report from MobiSense 'report channels'
R1:R2:S3=6.89:C ;	Request channel 1 and 2 force channel 3 to value 6.89 Ask for Confirmation (c). MobiSense will now respond with a SMS transmitting requested information.

REPORT

Report or Rapport	Request All Channels. Receive a "RAPPORT" code via an SMS.
CHANNEL=2,3,4,5,6	Channels to be transmitted by SMS module from MobiSense.

Set via SMS

[Group name]field name=parameter	Alter in a [group name] the field contents.
[Group name]field name?	Collect content of field name
Reset	reset unit (allowing system to read the new settings)

You are allowed to use ( ) in stead of [ ]
The SMS handler will translate ( ) to [ ] and save this in chip.ini setup file.

Command separator is a **;** This to avoid conflicts with file names.(a:/ b:/)

Examples:

[device]name=Logger01	rename MobiSense name to logger01
[channel_1]Sx=0	Reset channel x and MIN/MAX/STDEV & AVG function
[channel_1]alarmhigh=5	Set alarmhigh to value five in Channel_1
[channel_1]alarmhigh?	Request from Channel_1 the value from alarmhigh
[device]name=New unit **;**[channel_1]mode?	Change device to New unit" and request mode from channel_1.
R1?;N31619123456	request status channel one and send result to 31619123456

SMS telephone numbers

SMS_1=mobile number	destination for SMS
SMS_2=nummer_2	
SMS_3=nummer_3	
.	
.	
.	
SMS_10=nummer_10	maximum of 10 numbers.

GSM-GPRS:

GPRS

Controls the behaviour of the GSM/GPRS module

MODE=0/1
: Enables the GPRS mode

MANAGE=192.168.3.1
: If the GPRS switches online (PPP connected), the name and IP address can be transmitted to this address. This to resolve the status and IP address of remote units

EXTRACMDS
: Possibility to add extra initializing commands for the GPRS/GSM module.

DESTPORT
: Normally all communication to remote unit sis done over TCP port 7000, this port can be changed.

DYNDNS=0/1
: Set the service on or off

USER
: Username for the Dynamic DNS service

PASSWORD
: Password for the dynamic DNS service

HOSTNAME
: Hostname configured at the DynDns service (example: mobi.dyndns.org)

DNS
: Address of the DNS server in the IP network.

- - A NTP server (time sync) configured for date sync shall not be called in pwr mode 2.
- - However it will be called after a could start (pwr dwn –up)

SMS

KEEPALIVESMS= 1	Enable keep alive
KEEPALIVEINTERVAL=<TIME_IN_DAYS>	interval in days calculated from day of pwr-on.
KEEPALIVETIME=1100	Transmit keep alive at hour (000/2400)
SMSRECV=1	Enable SMS receiver
DNS=194.109.6.66	
SMSRECVPINCODE=7896	SMS pin code 4 characters maximum. Place this in front of your message to the MobiSense

Channel settings:

CHANNEL_n

MODE=

Mode of this channel
0= disabled
1= measure
2= generate
3= Not in use yet
4= Serial

More than one channel structure can refer to one measure source 128 channels are allowed.
The installation technician has to create new channel by adding then to the list.
[CHANNEL_1]
Wanted functions
.
.
.
.
[CHANNEL_128]
Wanted functions

REMOTE

Remote address unit name for generation of signals or remote IP address for measuring.
Data received by a remote MobiSense is identified by its name as defined by [DEVICE] in the remote unit.
If you want to address a remote MobiSense you have to use it's IP number or logical name like meetunit.provider.nl

REMOTE=213.124.45.56 (This IP address destinationtion)
REMOTE= Mobisense01 (Measurement source name of MobiSense)

REMOTEPORT

Remote port for generating

REMOTESUBPORT

Remote sub port for generating

VALUE

Display value of measuring data (V,mA, Bar, m/s etc)

LOSTLINKVALUEANA

Save value for generating if remote units fail

NOLOGING

If enabled (1) this channel will not be incorporated in the logfile

LOGSTOPLOW

Measured value to be defined to stop ALL the logging (ALL Channels).

LOGSTOPHIGH

Measured value to be defined to stop ALL the logging (ALL Channels).

SMS

SMSINDEX=n Send SMS to number N as defined in sms
SMSMAX=n Maximum numbers of measured values in one SMS message

Transmit format: [Stations name] [Channel number] [Date interval] [Space] [measured values]

Stationsname	10 chars
Channelnumber	1 char
Date	12 chars
interval	2 chars
Space	3 chars

Note: [] are **not** transmitted

Channel timers:

UPDATETIMER

Time to update remote unit with measured data.

LOSTLINKTIMER

Minimal time for the remote has to update the DAC, if not the DAC will set the 'Lostlinkvalueana' in the dac.
This is a protection mechanism allowing a default value in case of a lack of transmission (in seconds). The remote site will in form when the next data update is due.
Outputs will set to the value as defined by LOSTLINKVALUEANA when an update fails to arrive.

Channel Alarms:

Syntax alarmxxxx=value

ALARMLOW

Measured value to be defined to low, and to generate an alarm (=<)

ALARMHIGH

Measured value to be defined to high, and to generate an alarm (=>0

ALARMHIGHLIMIT

If both ALARMHIGH and ALARMHIGHLIMIT are invoked then:
Measured value between ALARMHIGH and ALARMHIGHLIMIT will generate an alarm. *

ALARMCHANGE

Measured value changed within given spec does generate alarm. Not implemented yet

ALARM

ALARM=
Point to an alarm structure to call if condition applies.
NAME=
Channel name, to display in LCD first 4 characters on screen.

Channel Alarm timers:

ALARMTIMER

Alarm threshold overdue to create alarm

ALARMUPDATETIMER

Measured value update frequency in seconds at alarm high or alarm low.

Note *: **Careful**: build a new channel if you want to produce an alarm for signals above the ALARMHIGHLIMIT.

Calculations:

CALC

Calculation on input value, at default the ADC measures -10 to +10Volt, so the value will be -10 to +10.
Various calculations can be made: * + - / ^ at default calculation are made on this channel, but other channels can be incorporated in the calculation by means of cx where x is the channel.
Example
CALC=*10,-1,/3,-C4 (C4 calculated value other channel (c4 in this example))
Calculations are made form left to right.

FORMULA

FORMULA = MIN/MAX/AVERAGE/STDDEV

MIN

Get the minimal value of n samples, where n = ENTRIES
ENTRIES=n

MAX

Get the maximal value of n samples, where n = ENTRIES
ENTRIES=n

AVG

Get the average value of n samples, where n = ENTRIES
ENTRIES=n

STDEV

Get the standard Deviation of n samples, where n = ENTRIES
ENTRIES=n

Low power mode

ALARMUPDATETIMER=60 Take each minute a sample
ALARMTIMER =10 Alarm threshold

The measured value is expressed in a scale zero to 2.5 Volts as result of 0-25 mA.
Ten mA does produce one Volt in the low power equation.

ALARMLPLOW=0.7 0.7 Volts equals 7 mA at input.
ALARMLPLOWLIMIT=0.6

Wake-up between 0.6 en 0.7 Volt

ALARMLPHIGH=0.8
ALARMLPHIGHLIMIT=1.1
Wake-up between 0.8 en 1.1 Volt

After wake-up value is handed to Channel

Be careful here the type of interface used defines the measured value scale handed to the channel.
This is 0-2,5 Volt using a standard one port 4-20mA interface.
Multiply by ten is required to express the value in mA.

CALC=*10
VALUE=mA

// hier is de waarde teruggebracht to 0-16 mA ipv 4-20 mA

ALARMLOW=7

ALARMLOWLIMIT=6

ALARMHIGH= 8

ALARMHIGHLIMIT= 11

Configuration examples:

Serial data example:

```
[CHANNEL_2]
MODE=4                          <- Serial Channel
PORT=16                         <- Serial port
REMOTE=213.45.46.28             < Address to send the data to.
```

The extra MobiSense serial port is used to collect serial data for transportation to a remote site. The connection is made via the DB9 (v24) or the RJ 11 (RS485) connector.

The serial port is switched between the two the result is:

Data via the DB9 or
Data via RJ11
MobiNode protocol is designed to connect via the RJ11.

SMS:

Only SMS relevant information is printed.

```
[SMS]
SMS_1=CCnnnnnnnnn               CC country 31 for then Netherlands nn Mobile number.
SMS_2=NUMMER_2
SMS_3=nummer_3
SMS_4=nummer_4

[ALARM_1]
SMS=1                           Channel_1 will produce a trigger called alarm1
NAME=Tester

[CHANNEL_1]
NAME=Flow                       Name of sensor.
MODE=1                          input device.
PORT=3                          physical port of measure interface
CALC=*10                        multiply the input value with ten.
ALARMHIGH=3                     produce alarm calculated value >3
ALARMTIMER=5                    Excite Alarm threshold > 5 then produce alarm 1
ALARMUPDATETIMER=60             Send this alarm every 60 seconds.
ALARM=1                         Execute alarm_1
```

Scaling:

In a Lm to Mm input environment representing a Wu to Wp scale

V = Wu + (Mv – Lm) x (Wp – Wu)/(Mm-Lm)

Wu= wanted under value eq. scale like –10 Bar
Wp=Wanted upper value eq. scale like +120 Bar
Mv=measured value in the input current loop.

Example : Lm=4mA, Mm=20ma,Wu=-10 Bar, Wp=+38 Bar, Mv=12mA

V= -10+(12-4) x (+38-(-10))/(20-4)
V= 14 Bar

Calculation 1:

[CHANNEL_1]
NAME=Height Assume that the Calculation for height= 10+(10*measured mA-4) / 6.5
MODE=1
PORT=3
Calc= *10, -4,/8,+10
First go to the correct scale: times ten
Subtract 4
Divide by 6.5
Add 10
ALARMHIGH=20 produce alarm calculated value >20

Calculation 2:

[CHANNEL_2]
NAME=Height2 Assume that the Calculation for
Height= (10*measured value – result of channel1)/2
MODE=1
PORT=3
Calc= *10, -C1,/2
First go to the correct scale: times ten
Subtract the value of channel 1
Divide result by two
ALARMHIGH=1 produce alarm when calculated value >1

Average:

CHANNEL_2]
NAME=Gem Assume that we want to calculate average
MODE=1
PORT=3
FORMULA = AVERAGE
ENTRIES=100 the system will take the average over 100 samples. Sample interval is interface depended.

Standard deviation

[CHANNEL_2]	
NAME=SGem	Assume that we want to calculate standard deviation
MODE=1	
PORT=3	
FORMULA = STDDEV	
ENTRIES=100	the system will take the standard deviation over 100 samples each sample takes one second.

Excitation:

[ALARM_1]	Alarm number one
EXCITATION=3	point to excitation unit
VOLT5=1	Switch 5 volt supply on
ALARMTIME=30	Keep this condition for 30 seconds. (Switch to 0V after 30 seconds)
[EXCITATION_1]	
VOLT24=1	24V output on
VOLT5=0	5V Output oFF
REF1=0	ext ref 10V off
REF2=0	ext ref 10V off
[CHANNEL_2]	
NAME=Frequency	Name function
MODE=1	set input
PORT=176	Port number 176
SUBPORT=3	Sub port 3
VALUE=Hz	Output name identifier is Hertz
ALARMHIGH=10000	Produce alarm above 10KHz.
ALARM=1	Execute alarm one

Multi channel:

All channels taking measurement from port 160 is sub port 2.

[CHANNEL_2]
NAME=Pressure
MODE=1
PORT=160
SUBPORT=2
CALC=*20
ALARMLOW = 6 *alarm is set under 6 bar*
ALARMHIGH=12
ALARMHIGHLIMIT=20 *alarm is set between 12 and 20 bar.*
ALARM=1 *execute alarm_1 if true*

[CHANNEL_3]
NAME=Pressure
MODE=1
PORT=160
SUBPORT=2
CALC=*20
ALARMHIGH=23
ALARMHIGHLIMIT=26 *alarm is set between 23 and 26 bar.*
ALARM=2 *execute alarm_2 if true*

[CHANNEL_4]
NAME=Pressure
MODE=1
PORT=160
SUBPORT=2
CALC=*20
ALARMHIGH=30 *alarm is set above 30 bar.*
ALARM=3 *execute alarm_3 if true*

Measurements via Ethernet:

[CHANNEL_4]
NAME=Pressure
MODE=1
PORT=160
SUBPORT=2
CALC=*20
ALARMHIGH=30 alarm is set above 30 bar.
UPDATETIMER=60 *send every 60 seconds the measured value*
REMOTE=192.168.1.12 *address of receiving station. measurepoint.your site.com is also allowed*

Alarm via Ethernet:

[CHANNEL_4]
NAME=Pressure
MODE=1
PORT=160
SUBPORT=2
CALC=*20
ALARMHIGH=30 alarm is set above 30 bar.
UPDATETIMER=0 send not the measured value
REMOTE=192.168.1.12 address of receiving station. measurepoint.your site.com is also allowed
ALARMUPDATETIMER=10 send every 10 seconds the measured value

If you make updatetimer=120 then measured value goes every 120 seconds to remote side.
Interval is raised to 10 when alarm is active.

SMS output:

[CHANNEL_1]
NAME=Niveau
DISPLAY=1
MODE=1
PORT=3
CALC=*1000
VALUE=mm
UPDATETIMER=600 Take every 600 seconds a sample and add to list
SMSMAX=25 send all measured values from list in one message if counter >25
SMSINDEX=1

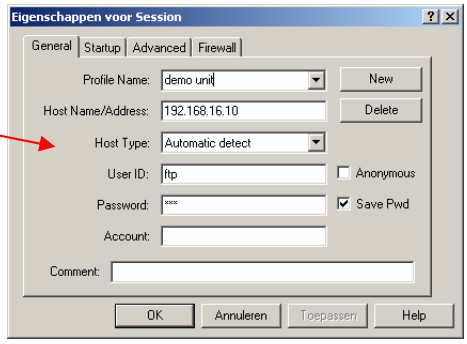
[SMS]
SMS_1=xxnnnnnnnnnn
SMS_2=nummer_2
SMS_3=nummer_3
SMS_4=nummer_4

Correcting reading errors:

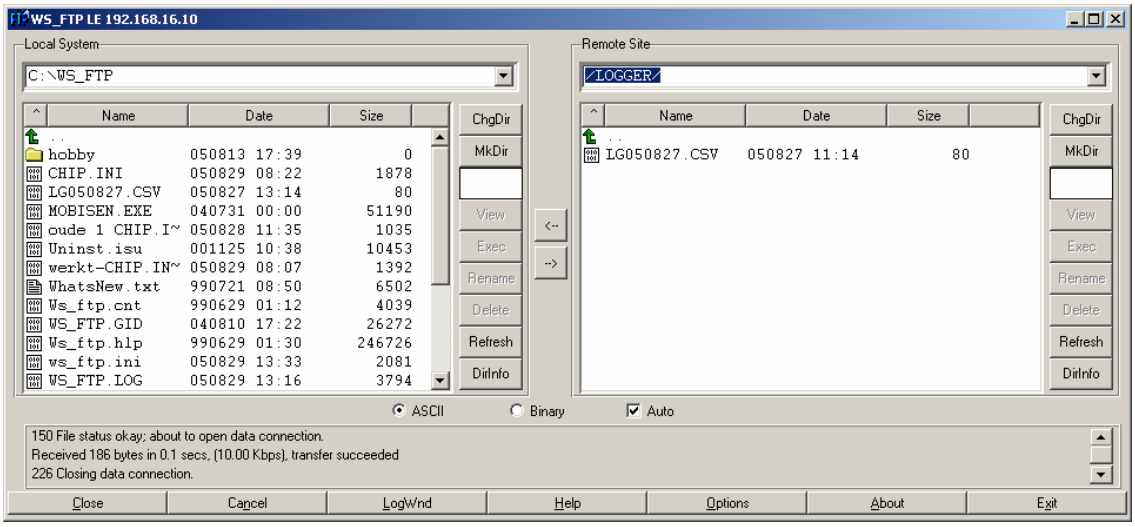
You need a accurate volt/mA meter plus a voltage or current source.
Build channel see previous information.
Set calc =*1000 the measured value becomes visible after power on.
Place the mA meter in serial with MobiSense current input and current source.
Reboot the MobiSense.
Make the following calculation
NewV =Divide mA meter reading by MobiSense reading.
This value should be your correction.
Set CALC= NewV
Repeat procedure above.
The same procedure applies to voltage as well.

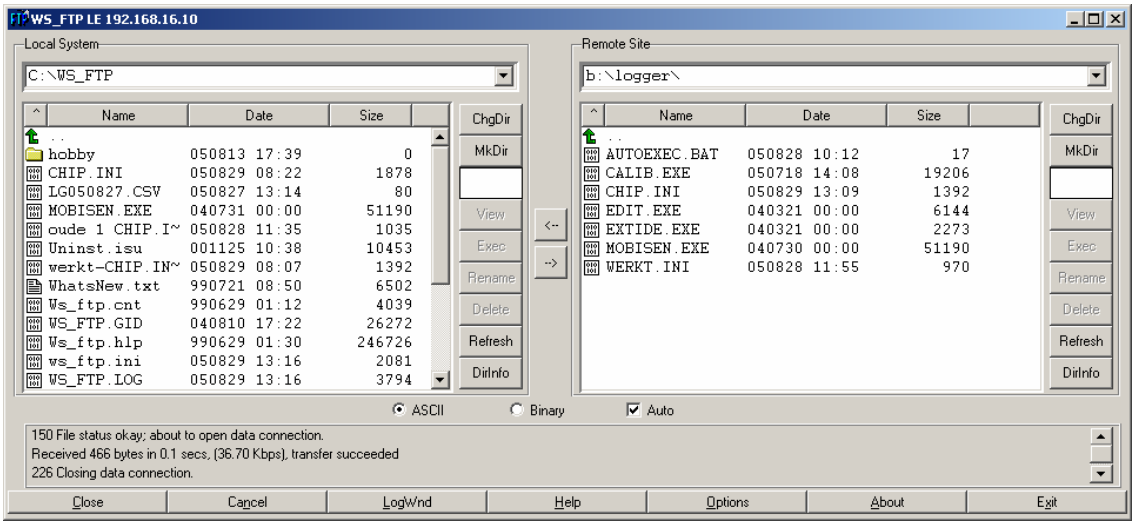
FTP data from CFD:

This example based on WS_ftp program could be obtained from http://www.ipswitch.com.
Make sure that you store you data in a directory and NOT in the root.(in this example directory name is logger).
Start ws_ftp and ensure that Pc and MobiSense are using same IP segment using different addresses.
The default login and password are ftp, which you may alter, in a later stage.

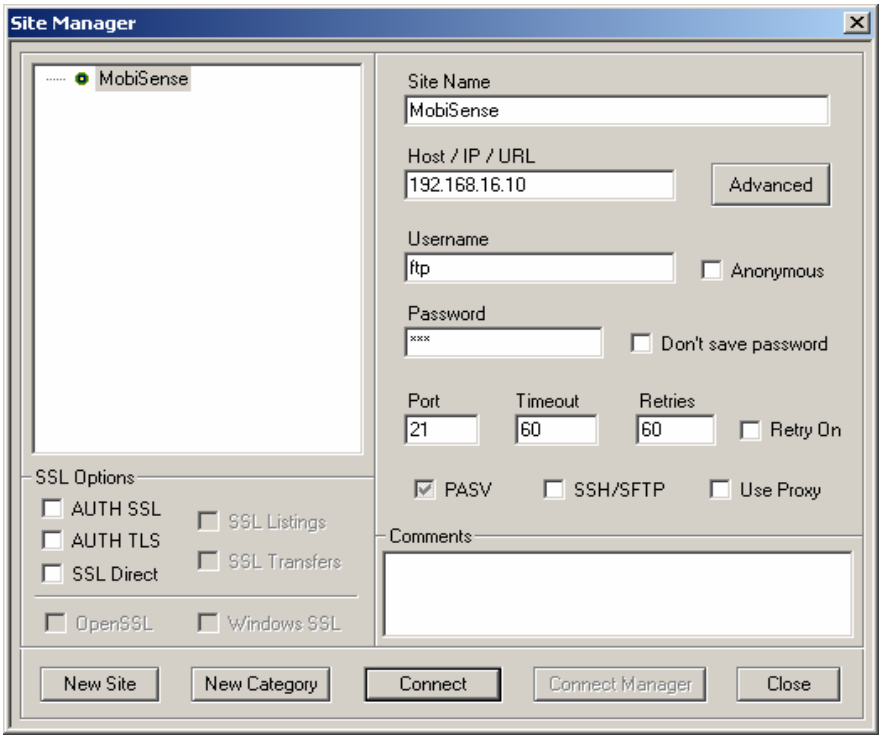


After a successful login the screen at the bottom of this page appears. Type at remote site input field b:\logger\ and hit return. Collecting data is simple select at the left hand site destiantiontion and use ← key to transfer the file.
That's all.

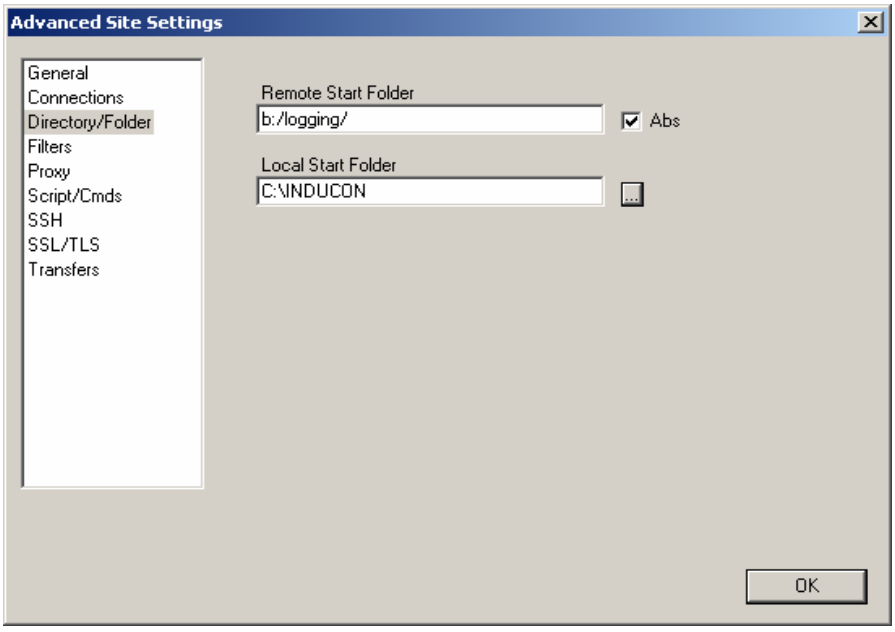




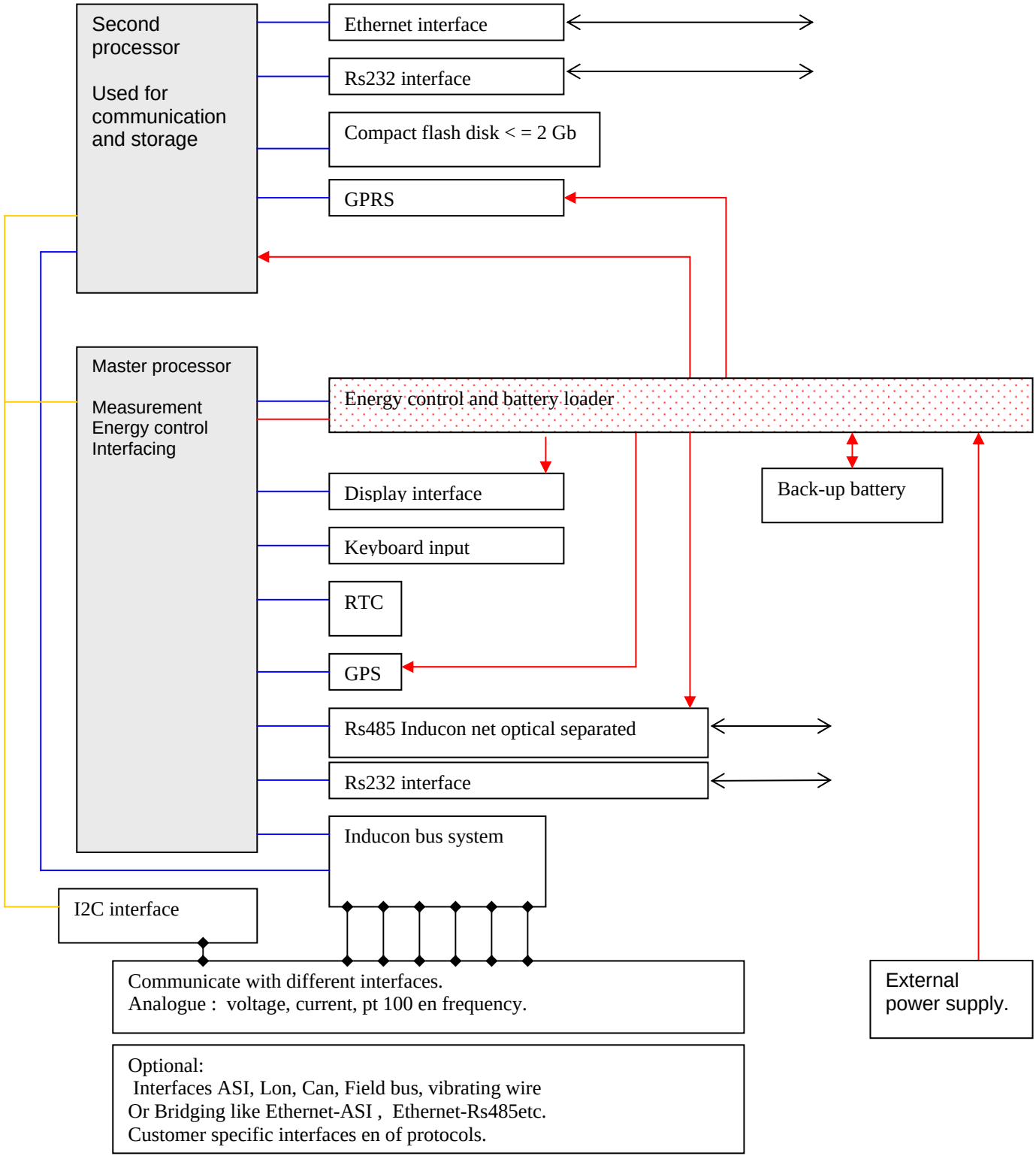
This example based on the free FTP lite version obtainable from www.Coreftp.com.
After installations: enter all fields see drawing below.
Now hit advanced button



A new screen will appear select Directory/folder and enter information wanted.
Do not forget to check Abs. Do not change any other setting unless you have to.
Hit ok and save settings at page to come. That's all.



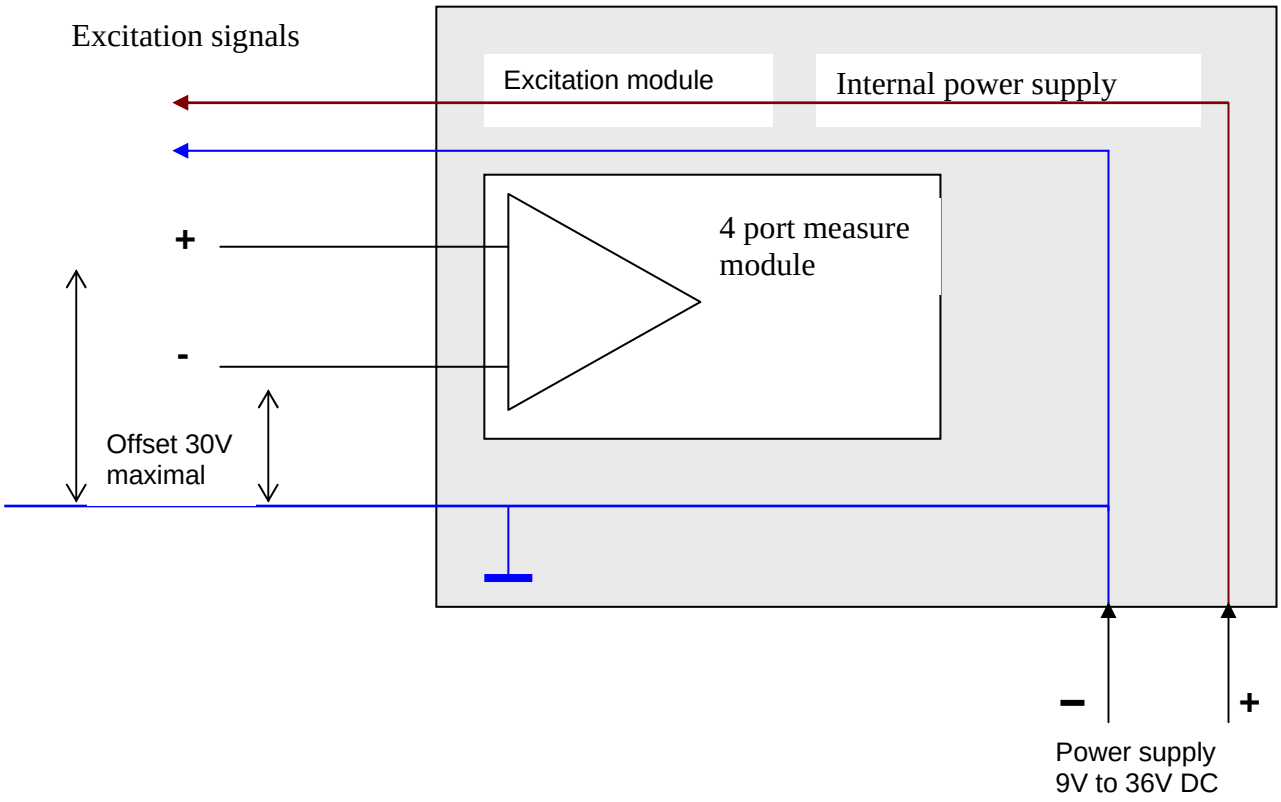
Internal power management:



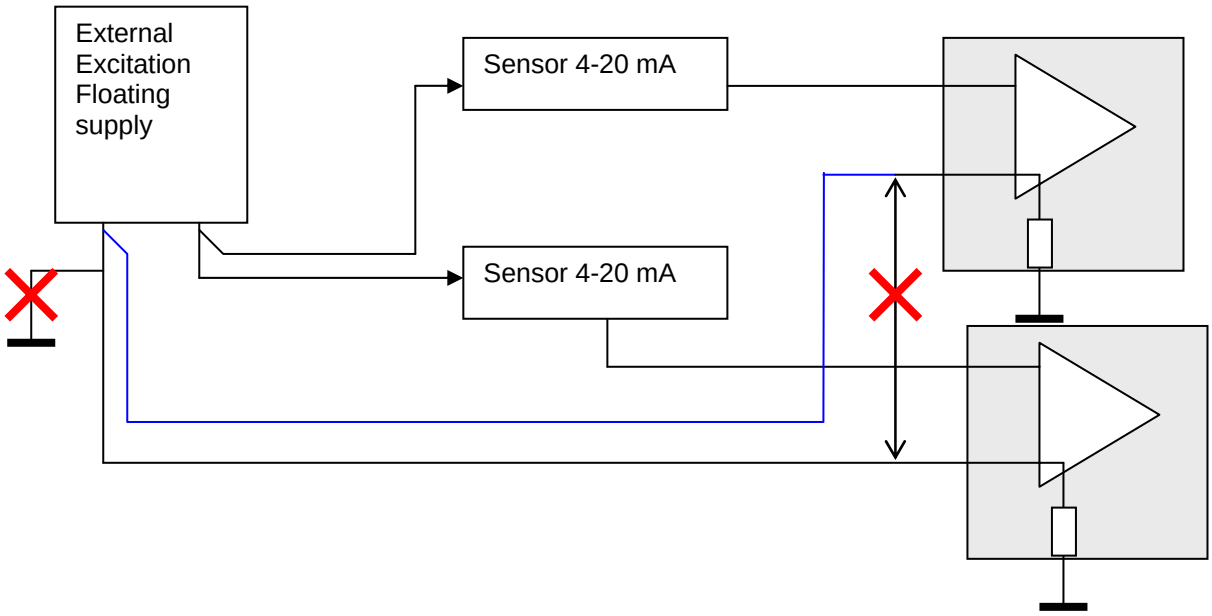
Galvanic awareness:

The MobiSense general ground is used to connect to all non-isolated devices like 4 port measure, excitation and single current in. Avoid ground loops and pay attention to the wiring when excitation is supplied form other locations.

Many measurement problems are solved due to differential method. However current measurements should never share wire or ground.



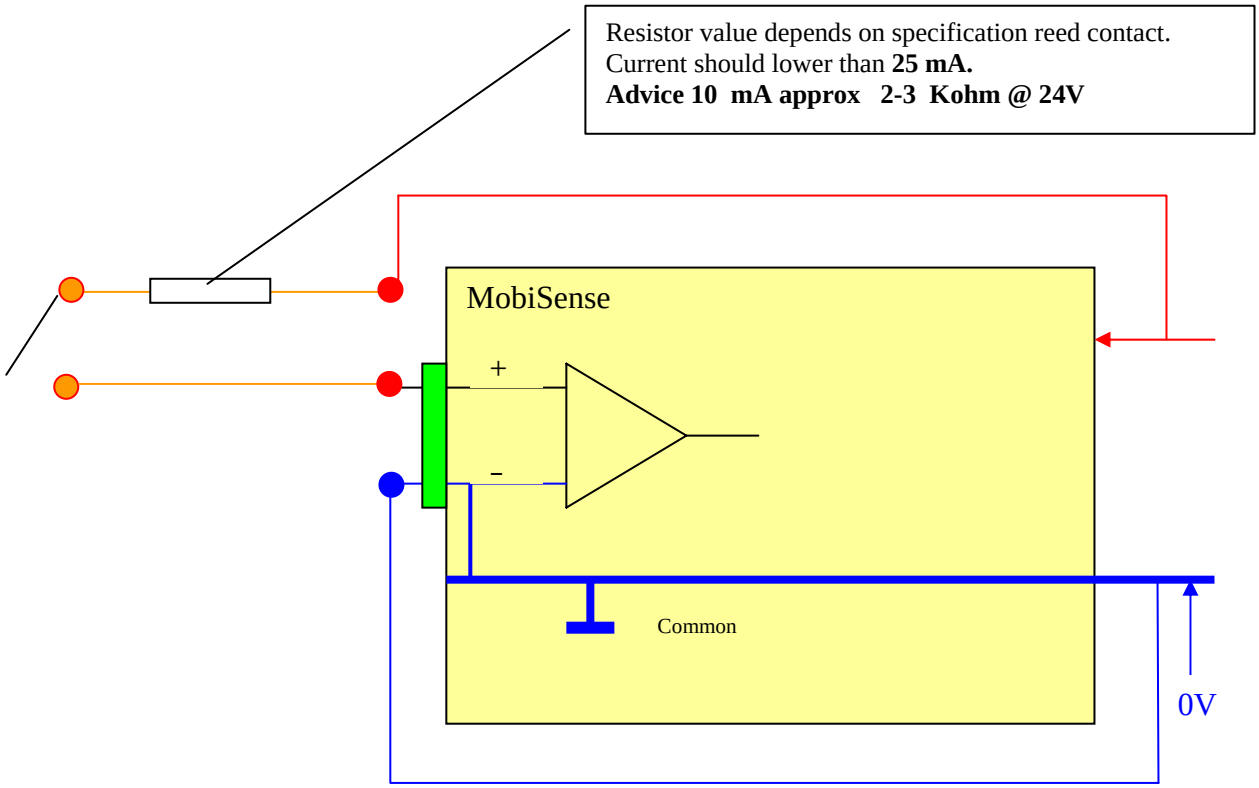
External excitation:



Avoid connections as indicated with a red cross out.
It looks electronically correct to make these connections however currents via ground and or more currents over one wire may cause an offset in measured value.

Counter with reed contact.

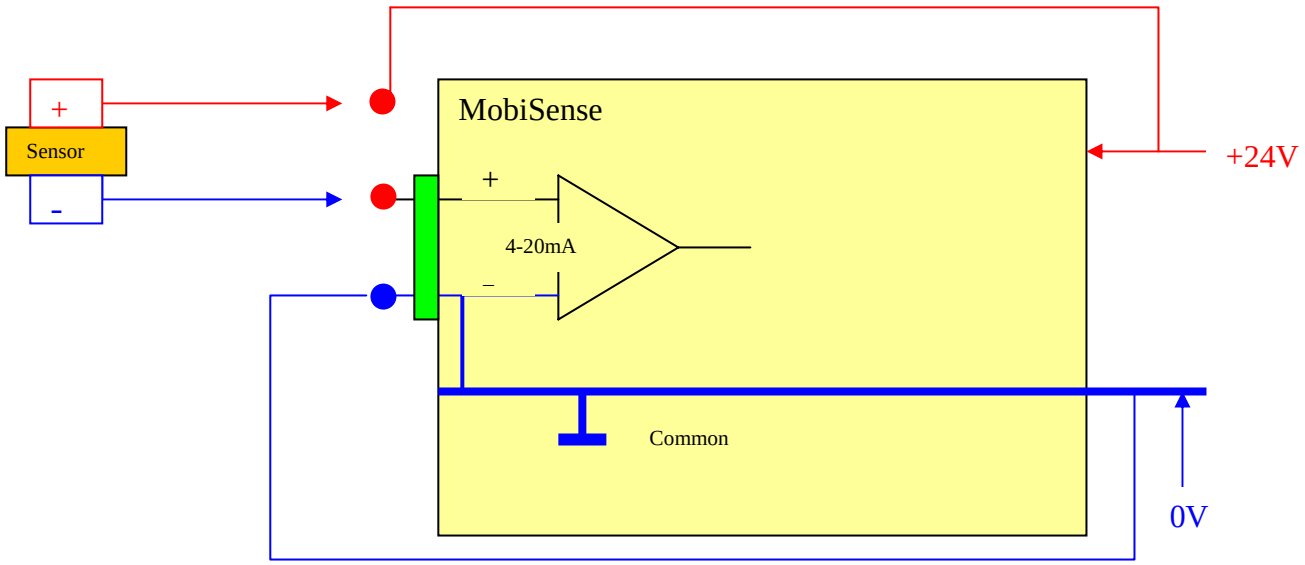
Reed contact connected to a 0-20 mA input



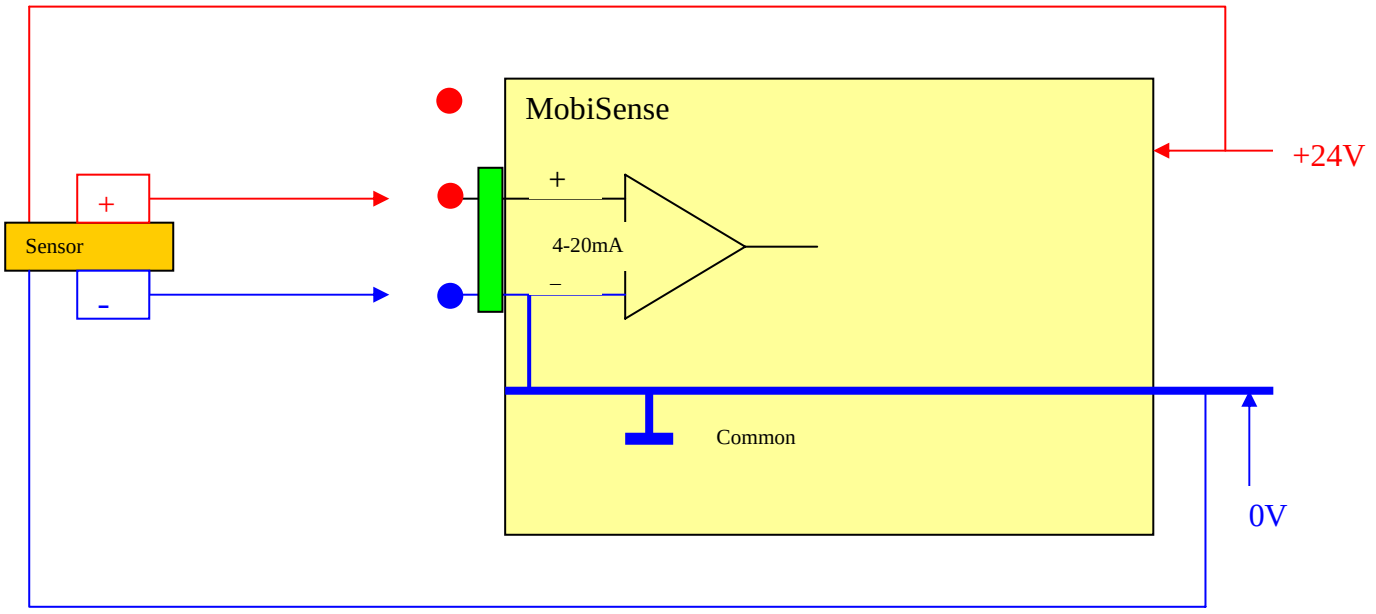
Current loop 4-20mA

Current loop 0-25 mA

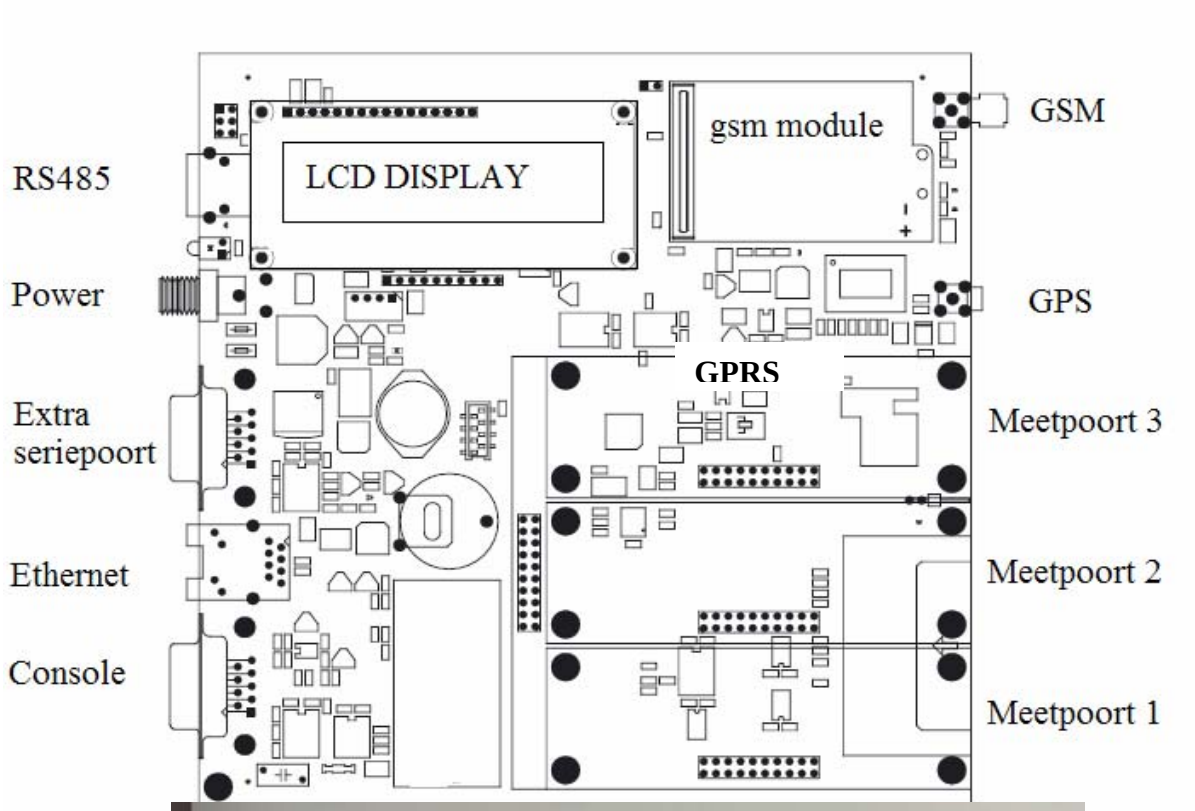
Tw0 wire
External excitation

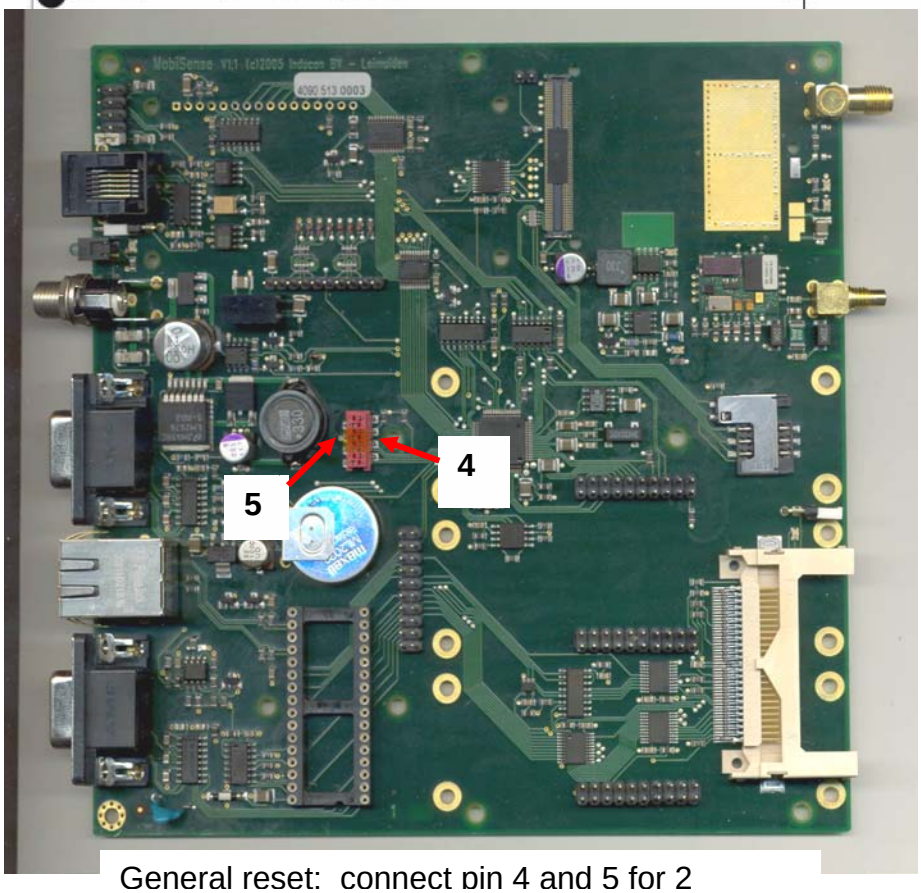


Four wire current loop sensor with external power supply



Connectors:





General reset: connect pin 4 and 5 for 2